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Some Californian Ranunculi.

BY EDWARD L. GREENE.

The first one I would mention, although it is a very common plant of the California Coast Range, and especially plentiful among the hills back of Oakland and south of San Francisco, was first noticed in the Botany of the State Geological Survey (1876), where it is named *R. hebecarpus*, var. *pusillus*. The flowers of this plant have not yet been described. They are so minute as to become, in the dried specimen, nearly invisible. Even with the fresh plant in hand, something better than a pocket lens is requisite to the revealing of their characteristics, which are very unique indeed. They are remarkable among flowers of this genus both for the extreme paucity of their parts, and for the very curious kind of symmetry which they display.

By way of preparing the reader's mind to rightly appreciate the symmetry referred to, and which I am about to describe, let me say that the flowers of Ranunculi in general are not so wholly unsymmetrical as they are commonly allowed to be. The sepals are five, the petals five (in some species ten or fifteen), the stamens and pistils both (theoretically at least, and often in fact), of some larger multiple of five. Of the species here under consideration, I have examined this year some scores of examples, and I find the following to be the rule of its floral structure. It has, instead of the five sepals of ordinary Ranunculi, four only; and these four sepals are, moreover, not flat and reflexed according to the rule in the genus, but spreading and somewhat cymbiform, each embracing a pistil, much after the manner in which a number of the Californian Compositæ have the ovaries of their ray-flowers enfolded each by a corresponding involucral bract.

In the place of the missing sepal of the five there occurs, ordinarily, not a petal but a stamen. That this particular stamen, which stands by itself alongside the one akene that lacks a subtending sepal, replaces the missing sepal we know from the fact that the stamens themselves are as definite in number as are the sepals, each of them as strictly keeping its own place; and the stamens too are four only. The petal is solitary, and, instead of taking the place, as it might have been expected to do, of the missing sepal, it appears on the opposite side of the flower, there replacing what might have been a fifth stamen. We have then, so far, four sepals, one petal and four stamens, making collectively nine parts of the flower; and the symmetry is completed, up to the requisite number of fifteen parts, by the pistils being, as they almost always are, just six, of which five are inserted in a whorl around the margin of the minute receptacle, and the sixth sits centrally and apart from the rest on the summit of it. Such is the ordinary number and arrangement of the parts of the flower in this most interesting little plant. I have observed, however, not a few instances of deviation from the rule; but these have been what may be called, if the paradoxical phrase may be allowed, very regular deviations from the rule, not affecting the numerical total of fifteen parts to each flower. There may be five pistils and two petals, the stamens and sepals each remaining four; or five pistils, five stamens, one petal and four sepals. When the petals are two, one of them takes the place of the missing sepal and is, in some respects, intermediate between a sepal and a petal, being uncommonly large for a petal of the species, and destitute of any trace of the nectariferous pit. In this case, too, the second petal is reduced in size, and appears like a kind of half-way affair between petal and stamen. The normal solitary petal seen under a good magnifier consists of rather distinct lamina and claw, with a comparatively large nectariferous pit (without scale) located at base of the lamina, which last named part about equals the claw in length. The plant is strictly annual, very slender, weak and often reclining, growing in shady and rather wet places, often in company with *Montia fontana*. The typical *R. hebecarpus* inhabits the Sierra Nevada, rather beyond my reach. It is quite different in appearance, and, although much cannot be learned about its flowers from the dried specimens, its akenes are many and quite indefinite, forming a close round head. For the variety here described I dare not yet propose that specific name and rank which it will some day command, if the other fail to exhibit more or less of its really wonderful characteristics. I wait for some possible coming opportunity of comparing the two in living specimens.

From this, perhaps, smallest of all Ranunculi, I pass to give an account of what is no doubt the very largest of the genus, namely:

RANUNCULUS MAXIMUS. Stems thick and fistulous, 2 to 5 feet long, but weak and reclining: herbage more or less bristly-hirsute: leaves broad, alternately divided, the radical on petioles 1 to 1½ feet long, leaflets laciniately lobed; petals five to eight, and 10 lines long, oblong-obovate, obtuse, the nectariferous scale correspondingly large; akenes compressed, but not strongly so, rather thick, tipped with a long, stout, erect, slightly incurved style, forming a globose or round-ovate head. *R. macranthus*, Brew. & Wats., Bot. Cal., i, 8, not of Scheele; *R. orthorhynchus*, var. *platyphyllus*, Gray, Proc. Am. Acad. xxi, 377, as to the Californian plant at least.

Were I compelled to choose between the two different disposals of this plant which have been made by the authors above cited, I should take the first. It is surely every way more like the Mexican *R. macranthus* than it is like *R. orthorhynchus* of the Columbia River region. The good fruit characters of the latter species, as shown in well-matured specimens from near Portland, Oregon, and which agree perfectly with Hooker's figure, are these: a much compressed thin akene; styles rather slender, perfectly straight and conspicuously spreading, i. e. standing out in all directions at right angles with the center of their axis, giving a very bristling aspect to the head. In *R. maximus* they are, as I have said, not only not straight; they are spreading, but in a less degree, pointing in a direction more inclined to a parallel with the axis. The remarkable differences of foliage, size and habit of the two plants need not here be repeated. They can be learned by reference to any description of the original and unconfused *R. orthorhynchus.*

Our most common Californian species of this genus, the one which makes yellow with its brilliant bloom all the running hillsides of the western parts of the State in the months of March and April, appears to have been passing for many years under a name which, by right of priority, does not belong to it, and which should therefore be rejected from henceforth. It is

Ranunculus Deppei, Nutt. in Torr. and Gray, Fl. N. Am. i, 21 (under *R. acris*), A.D., 1838=*R. Californicus*, Benth. Pl. Hartw., 295, A.D., 1857.

Both Ferdinand Deppe, (1832) and Thomas Nuttall, 1836, had familiar knowledge of the species in their Californian travels about a dozen years before Theodore Hartweg came this way. Nuttall named the species for Deppe, it would appear. Then, some twenty years later, Mr. Bentham in treating of Hartweg's Californian collections, named the plant *R. Californicus*, and this new synonym was forthwith adopted by the American authorities, who thus relegated to obscurity or oblivion the true and rightful name.

Diœcism in Anemone acutiloba, Lawson.

In the *Anemone acutiloba*, Lawson, there is a manifest tendency to be diœcious. A year ago a plant was found, all the flowers of which were strikingly different from those of other plants near by. The dark-blue calyx was much smaller than the involucre, and the stamens were wanting. The pistils were from thirty-five to forty in each blossom, or about double the average number in perfect flowers. Only abortive stamens were found in two of the flowers. The stamens are numerous in normal flowers, and on account of their absence, if for no other reason, the blossoms under consideration appeared different from the ordinary sort. In addition to the absence of the stamens and the small size of the calyx, there was an unexpected development of the involucre. Instead of the ordinary number, there was a fourth bract which, although green, had the size and shape of the sepals. It, however, occupied a position close by the sides of the other bracts, and made up a part of the involucre which, in this *Anemone*, is situated a half inch or more below the flower.

Another deviation noticed in the involucre, was the much greater development of one of the bracts, and the dentate or notched tip which it possessed. The flower under consideration is shown (natural size) at *a* in the engraving. At *b* the same flower is seen with the calyx laid back so as to better indicate its size and the appearance of the centre of the flower with its pistils only. A rear view of the same blossom is given at *c*. In all of these the exaggerated size of one bract is easily seen, as also the manner in which its tip is developed into three quite sharp